Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

Check List 13(1): 2055, 21 February 2017 doi: https://doi.org/10.15560/13.1.2055
ISSN 1809-127X © 2017 Check List and Authors

Spilotes sulphureus Wagler, 1824 (Squamata: Colubridae): review of distribution and first record in the state of Sergipe, northeastern Brazil

Hugo Andrade[1, 3], **Rony Peterson Santos Almeida**[1, 2] & **Eduardo José dos Reis Dias**[1]

[1] Universidade Federal de Sergipe, Departamento de Biociências, Laboratório de Biologia e Ecologia de Vertebrados, Avenida Vereador Olímpio Grande s/n, Centro, CEP 49500-000, Itabaiana, SE, Brazil
[2] Programa de Capacitação Institucional, Museu Paraense Emílio Goeldi, Coordenação de Ciências da Terra e Ecologia. Avenida Perimetral, Terra Firme, CEP 66077-830, Belém, PA, Brazil
[3] Corresponding author. E-mail: hugoandrade915@gmail.com

Abstract: We present the first record of *Spilotes sulphureus* for the state of Sergipe. In Brazil, this species is distributed Amazon Rainforest, Atlantic Forest and Caatinga biomes. This large-bodied snake has arboreal habit, is diurnal, has oviparous reproduction, feeds on birds, eggs, lizards, bats, amphibians and small mammals and presents the defensive behaviour of lateral compression of the body.

Key words: *Pseustes*; gular inflation; puffing snake; geographical distribution; Atlantic Forest

The colubrid snake *Spilotes sulphureus* (Wagler & Spix, 1824) is one of the larger species of the family (Freitas 2003). This species was previously placed in the genus *Pseustes*, 1843 and was later allocated to the present genus (Jadin et al. 2014). This arboreal snake has cryptic coloration and is characterized by the defensive behavior of lateral compression of the body (Marques et al. 2006).

Spilotes sulphureus has wide distribution in rainforests of Brazil, Ecuador, Peru, the Guianas, and Trinidad (Peters and Orejas-Miranda 1970). In Brazil, this species is distributed in Amazon Rainforest (Cunha et al. 1985; Frota et al. 2005; Ávila-Pires et al. 2009; Bernarde et al. 2012), Atlantic Forest (Marques and Calleffo 1997; Argôlo 2004; Borges-Nojosa et al. 2006; Vrcibradic et al. 2011) and Caatinga (Guedes et al. 2014).

On 31 May 2012 and 26 January 2013 two specimens of *Spilotes sulphureus,* female (1075 mm SVL) and male (1030 mm SVL) (Figures 1 and 2, respectively), were collected on the edge of an Atlantic Forest fragment in Refúgio de Vida Silvestre Mata do Junco (RVSMJ) (10°32′23″S, 037°03′43″W; 162 m above sea level) in the municipality of Capela, Sergipe state, Brazil.

The specimens were collected under permit 34437-1 issued by ICMBio and are housed in the snake collection of the Laboratório de Biologia e Ecologia de Vertebrados

Figures 1 and 2. Live adults of *Spilotes sulphureus*. **1.** LABEVS32 female, 1075 mm. **2.** LABEVS44 male, 1030 mm. Photos by RPSA.

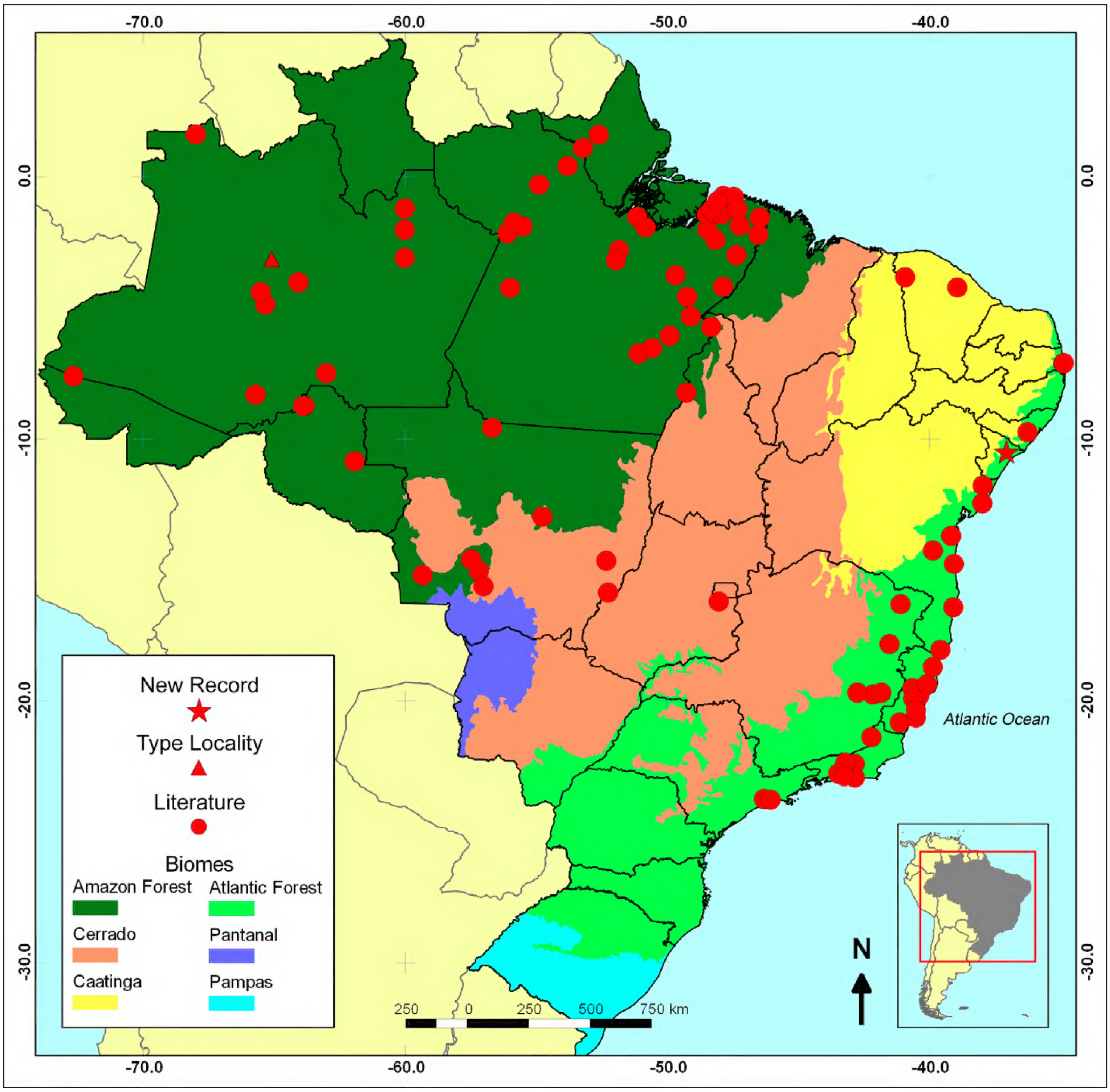

Figure 3. Geographic distribution of *Spilotes sulphureus* in Brazil, based on data from Table 1.

(LABEV), Universidade Federal de Sergipe (UFS) (LABEVS 32 and LABEVS 44).

Spilotes sulphureus presents the following characters: dorsal scale rows 21, scales keeled and with one pair apical pits; subcaudals paired, 122; ventrals 215; anal plate divided; internasals in contact with rostral, anterior and posterior nasal and prefrontals; prefrontals in contact with frontal, posterior nasal, loreal, preocular, and supraocular; frontal in contact with prefrontals, supraocular and parientals; supraocular 1; postorbitals 3; preorbital 1; upper labials 8; lower labials 10; anterior mentals in contact with the mental groove and posterior mentals separated by small gular scales (Lisboa et al. 2009).

Spilotes sulphureus may exhibit polymorphism in color. Some individuals are yellow-brown with variable black bars on the dorsum, head and upper labials, and yellow venter (Cunha et al. 1985) (Figure 1). Other individuals are immaculate yellow anteriorly, becoming darker posteriorly (Figure 2), as in Borges-Nojosa et al. (2006). Most records of *S. sulphureus* are from the Amazon and Atlantic Forest biomes (Figure 3), likely associated with the arboreal habit of the species (Martins et al. 2008). This snake is diurnal (Freitas 2003), feeds on birds (Rivas and Kane 2003; Alves et al. 2005), bats (Rufino and Bernardi 1999), lizards, small mammals, and amphibians (Marques et al. 2001; Freitas 2003).

This paper presents the first record of this species from the state of Sergipe (Figure 3). The new location is 125 km

Table 1. Localities of *Spilotes sulphureus* Wagler, 1824 in Brazil with coordinates and references.

State	Municipality	Collection site	Latitude	Longitude	Reference/collection number ‡
SE	Capela	Refúgio de Vida de Silvestre Mata do Junco	10°32′23″ S	037°03′43″W	This research
BA	Esplanada	not reported	11°47′46″ S	037°45′42″W	IBSP 49248
BA	Porto Seguro	Reserva Florestal da CVRD	16°26′59″ S	039°03′53″W	MBML 396
BA	Itagibá	Centro da Cidade	14°17′00″ S	039°50′40″W †	Lisboa et al. (2009)
BA	Ituberá	Centro da cidade	13°43′31″ S	039°08′53″W †	Lisboa et al. (2009)
BA	Mata de São João	Reserva Imbassaí	12°28′45″ S	037°57′33″W	Marques et al. (2011)
BA	Mucuri	Centro da cidade	18°04′33″ S	039°33′37″W †	Lisboa et al. (2009)
BA	Ilhéus	Centro da cidade	14°47′37″ S	039°02′46″W †	Lisboa et al. (2009)
AC	Cruzeiro do Sul	Centro da Cidade	07°37′40″ S	072°40′33″W †	Silva et al. (2010)
AL	Campo Alegre	Fazenda Pindoba	09°45′32″ S	036°14′09″W	Lisboa et al. (2009)
AM	Coari	Base Operacional Geólogo Pedro de Moura	04°53′07″ S	065°21′00″W	Prudente et al. (2010)
AM	Coari	Porto Urucu	04°02′09″ S	064°04′43″W †	MPEG.HOP 023878
AM	Fazenda Scheffer	Rio Ituxi	08°20′00″ S	065°43′00″W	Avila-Pires et al. (2009)
AM	Humaitá	km 80 - BR - Humaitá a Lábrea	07°30′22″ S	063°01′15″W	IBSP 40818
AM	Manaus	Itacoatiara	03°06′07″ S	060°01′30″W	IBSP 40442
AM	not reported	Floresta marginal ao longo do rio Japurá	03°08′02″ S	065°06′00″W	(Type locality) Cunha et al. (1985)
AM	not reported	Río Japurá	01°37′00″ N	068°00′00″W	FPR 60223
AM	Presidente Figueiredo	U.H.E. Balbina	02°02′04″ S	060°01′30″W	IBSP 51986
AM	Presidente Figueiredo	Balbina. Área de inundação da UHE.	01°13′15″ S	060°01′24″W †	MPEG.HOP 017585
AM	Tefé	Porto Urucú.	04°24′51″ S	065°31′23″W †	MPEG.HOP 018225
AP	Laranjal do Jari	Cachoeira Santo Antônio.	00°46′39″ N	053°24′27″W †	MPEG.HOP 017739
AP	Serra do Navio	Distrito Maganífero, ICOMI	01°36′02″ N	052°36′45″W †	MPEG.HOP 000333
CE	Pacoti	Maciço de Baturité	04°14′09″ S	038°55′01″W	Borges-Nojosa et al. (2006)
CE	Ubajara	Parque Nacional de Ubajara	03°50′25″ S	040°54′28″W	Borges-Nojosa et al. (2006)
ES	Cachoeiro de Itapemirim	Estação Ambiente Ilha dos Meirelles	20°50′56″ S	041°06′46″W	Delfino & Rabello (2007)
ES	Colatina	not reported	19°32′22″ S	040°37′50″W	IBSP 49534
ES	Guarapari	Rodovia do Sol.	20°40′00″ S	040°29′51″W	MBML 2187
ES	Ibiraçu	not reported	19°49′55″ S	040°22′11″W	IBSP 49983
ES	Linhares	Degredo	19°23′28″ S	040°04′20″W	MBML 2140
ES	Santa Teresa	Santa Lúcia.	19°56′08″ S	040°36′01″W	MBML 449
ES	São Mateus	not reported	18°44′00″ S	039°51′00″W	MCZ R 3770
ES	Viana	not reported	20°23′25″ S	040°29′46″W	MBML 1946
GO	Luziânia	Pôrto Nacional	16°13′56″ S	048°01′51″W †	IBSP 19681
MA	Junco do Maranhão	Rio Gurupi. Nova Vida.	02°13′18″ S	046°30′58″W †	MPEG.HOP 013664
MG	Caratinga	RFMA (Trilha acesso KK-Q)	19°47′23″ S	042°08′21″W	UFMG 113
MG	Caratinga	RPPN Feliciano Miguel Abdala	19°43′00″ S	041°49′00″W	Palmuti et al. (2009)
MG	Jequitinhonha	Reserva Biológica da Mata Escura	16°20′00″ S	041°05′00″W	Duarte (2012)
MG	Marliéria	Parque Estadual do Rio Doce	19°42′44″ S	042°43′56″W	UFMG 112
MG	Teófilo Otoni	Próximo à captação São José.	17°51′27″ S	041°30′19″W	FUNED 3173
MT	Barra do Bugres	Est. Ecológica da Serra das Araras (SEMA)	15°03′21″ S	057°11′25″W †	MPEG.HOP 017062
MT	Barra do Garças	Fazenda Três Marias - norte de MT	15°53′24″ S	052°15′24″W	IBSP 30420
MT	Barra dos Bugres	Estação Ecológica da Serra das Araras	15°39′00″ S	057°01′00″W †	Nascimento et al. (1988)
MT	Nova Ubiratã	Margem esquerda do Rio Von den Steinen	12°59′35″ S	054°45′59″W	UFMT 5374
MT	Paranaíta	Sete quedas - Rio Teles Pires	09°35′40″ S	056°40′55″W	UFMT 8225
MT	Pontes e Lacerda	Fazenda Palmar	15°13′34″ S	059°20′07″W	IBSP 45429
MT	Tangará da Serra	not reported	14°37′10″ S	057°29′09″W	IBSP 50588
MT	Xavantina	264 - km norte	14°40′29″ S	052°19′33″W †	IBSP 29395
PA	Acará	Ipitinga. Estrada Mojú-Acará.	02°01′35″ S	048°27′37″W †	MPEG.HOP 015519
PA	Alenquer	not reported	00°18′31″ S	054°53′12″W †	MPEG.HOP 023677
PA	Almeirim	REBIO Maicuru	00°24′17″ N	053°48′09″W †	MPEG.HOP 023721
PA	Belém	not reported	01°27′00″ S	048°29′00″W	MCZ R 53215
PA	Benevides	Estrada de Genipauba	01°21′40″ S	048°14′36″W †	MPEG.HOP 015466
PA	Capitão Poço	Santa Luzia	01°52′13″ S	047°13′23″W	MPEG.HOP 002914
PA	Castanhal	Boa Vista	01°17′24″ S	047°56′34″W †	MPEG.HOP 010528
PA	Conceição do Araguaia	Codespar, Fz.	08°15′28″ S	049°15′53″W	IBSP 26762
PA	Curuçá	Marauá	00°44′01″ S	047°51′07″W †	MPEG.HOP 007091
PA	Dom Eliseu	Sítio Bela Vista.	04°12′03″ S	047°51′55″W †	MPEG.HOP 015534
PA	Inhangapi	Arraial do Carmo	01°27′15″ S	047°56′43″W †	MPEG.HOP 001566
PA	Itaituba	Parque Nacional Amazônia	04°15′07″ S	055°59′42″W †	MPEG.HOP 021139
PA	Jacundá	Rio Tocantins.	04°35′34″ S	049°14′05″W †	MPEG.HOP 016719
PA	Juruti	Estrada Juruti - Beneficiamento	02°09′46″ S	056°05′44″W †	MPEG.HOP 023258

Continued

Table 1. *Continued.*

State	Municipality	Collection site	Latitude	Longitude	Reference/collection number ‡
PA	Marabá	Serra Norte. Carajás. Área do manganês do Azul.	05°20′15″ S	049°06′04″W †	MPEG.HOP 017092
PA	Maracanã	km 23 da estrada de Maracanã	00°46′28″ S	047°27′15″W †	MPEG.HOP 004839
PA	Melgaço	Floresta Nacional de Caxiuanã. Itaperu.	01°32′08″ S	051°08′12″W †	MPEG.HOP 022080
PA	Óbidos	ESEC Grão Pará	01°54′05″ S	055°31′17″W †	MPEG.HOP 023749
PA	Oriximiná	Serra do Acarai	01°46′01″ S	055°51′36″W †	MPEG.HOP 023705
PA	Ourilândia do Norte	not reported	06°45′25″ S	051°04′54″W †	MPEG.HOP 025308
PA	Palestina do Pará	Porto Jarbas Passarinho. Transamazônica.	05°44′26″ S	048°19′07″W †	MPEG.HOP 013411
PA	Paragominas	Margem do rio Jaboti - Km 70.	02°59′45″ S	047°21′10″W	IBSP 32411
PA	Parauapebas	Núcleo Urbano. Acesso Sul. Carajás	06°04′33″ S	049°53′56″W †	MPEG.HOP 023009
PA	Peixe-Boi	not reported	01°14′55″ S	047°18′51″W	MPEG.HOP 002588
PA	Portel	Centro da Cidade	01°56′08″ S	050°49′16″W	IBSP 45869
PA	Rio Parauapebas	Serra do Carajás	06°33′00″ S	050°34′00″W	CUNHA et al. (1985)
PA	Santa Bárbara do Pará	Parque Ecológico de GUNMA.	01°14′56″ S	048°17′27″W †	MPEG.HOP 021323
PA	Senador José Porfírio	UHE-Belo Monte	02°48′18″ S	051°50′14″W †	MPEG.HOP 020985
PA	Tomé-Açu	Ipitinga. Estrada Mojú-Acará.	02°25′06″ S	048°09′16″W †	MPEG.HOP 013356
PA	Tucuruí	Margem esquerda do Rio Tocantins	03°45′58″ S	049°40′21″W	IBSP 47060
PA	Vigia	Santa Rosa, Estrada da Vigia.	00°56′44″ S	048°04′42″W †	MPEG.HOP 009309
PA	Viseu	Santa Luzia	01°33′50″ S	046°27′23″W †	MPEG.HOP 014124
PA	Vitória do Xingú	UHE-Belo Monte.	03°11′29″ S	051°57′40″W †	MPEG.HOP 019876
PB	João Pessoa	APP Mata do Buraquinho	07°08′42″ S	034°51′54″W	SANTANA et al. (2008)
PB	João Pessoa	Centro da Cidade	07°07′08″ S	034°50′42″W †	LISBOA et al. (2009)
RJ	Cachoeiras de Macacu	Estação Ecológica Estadual do Paraíso	22°26′00″ S	042°50′00″W	VRCIBRADIC et al. (2011)
RJ	Duque de Caxias	Parque Natural Municipal de Taquara	22°35′00″ S	043°14′00″W	SALLES et al. (2010)
RJ	Maricá	Litoral da cidade	22°57′19″ S	042°49′56″W †	LISBOA et al. (2009)
RJ	Miracema	not reported	21°24′44″ S	042°11′48″W	IBSP 22754
RJ	Petropolis	not reported	22°23′20″ S	043°11′14″W †	MNHN(RA) 1877.180
RJ	Rio de Janeiro	Serra do Mendanha	22°48′00″ S	043°28′00″W	PONTES et al. (2009)
RJ	Rio de Janeiro	not reported	22°54′00″ S	043°14′00″W	MCZ R 1381
RO	Porto Velho	UHE JIRAU. Jací-Paraná	08°45′23″ S	063°51′18″W †	MPEG.HOP 023989
RO	Ji-Paraná	Centro da Cidade	10°52′41″ S	061°56′06″W †	BERNARDE et al. (2012)
RO	Porto Velho	Centro da Cidade	08°45′40″ S	063°54′06″W †	BERNARDE et al. (2012)
SP	Paranapiacaba	Centro da Cidade	23°46′36″ S	046°17′57″W †	LISBOA et al. (2009)
SP	Paranapiacaba	not reported	23°48′00″ S	046°03′00″W	MARQUES & CALLEFFO (1997)

* State abbreviations: AC, Acre; AL, Alagoas; AM, Amazonas; BA, Bahia; CE, Ceará; ES, Espírito Santo; GO, Goiás; MA, Maranhão; MG, Minas Gerais; MT, Mato Grosso; PA, Pará; PB, Paraíba; RJ, Rio de Janeiro; RO, Rondônia; SP, São Paulo; SE, Sergipe.

† Not exact geographical position.

‡ Collections acronyms: Foundation Puerto Rastrojo (FPR- Colômbia); Foundation Ezequiel Dias (FUNED); Instituto Butantan (IBSP- São Paulo); Museum of Biology Prof. Mello Leitão (MBML); Museum of Comparative Zoology, Harvard University (MCZ); Muséum National d'Histoire Naturelle Reptiles and Amphibians Collection (RA) of the Muséum National d'Histoire Naturelle (MNHN - Paris); Museum Paraense Emilio Goeldi - Ophidia Collection (MPEG.HOP); Museum of Zoology of the University of São Paulo (MZUSP); Universidade Federal de Mato Grosso (UFMT); University Federal de Minas Gerais (UFMG).

south of the nearest locality at Pindoba Farm, municipality of Campo Alegre, Alagoas (LISBOA et al. 2009), and 160 km north of the nearest locality in Bahia (IBSP 49248). The location is 3242 km from the type locality on the Japurá River, Amazonas (CUNHA et al. 1985).

This new record fills a gap in the distribution of the species, and contributes to knowledge of the biological diversity in Sergipe state, which is relatively poorly known.

ACKNOWLEDGEMENTS

We thank J.M.G. Santos-Júnior, D.N. Costa, E.L. Alves, A.C. Lima and M.L. Mota for help with fieldwork; A.L.C. Prudente for records this species in the Herpetological Collection of the Museum Paraense Emílio Goeldi; Secretaria de Meio Ambiente e Recursos Hídricos of the state of Sergipe; and ICMBio for logistic support and collecting permission in the RVSMJ.

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Authors' contributions: HA wrote the text; RPSA collected the specimens and wrote the text; and EJRD identified the specimens and wrote the text.

Received: 24 June 2016
Accepted: 15 February 2017
Academic editor: Ross MacCulloch